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METEOROLOGY AT THE BRITISH ASSOCIATION.

By E. Gold, M.A.

For the fifth time in its history the British Association for the Advancement of Science met in one of the British Dominions beyond the Sea, the gatherings being held on this occasion in the various State capitals of the Commonwealth of Australia, during the month of August, 1914.

The principal meteorological event was a discussion on Antarctic Meteorology, opened by Dr. G. C. Simpson, of the Meteorological Office, Simla, who accompanied Scott's last Antarctic Expedition. Dr. Simpson gave a brief resumé of the prevailing views upon the general circulation in the polar half of the Southern Hemisphere, as given principally by Dr. W. J. Lockyer, in his "Southern Hemisphere Surface Air Circulation," and Prof. Meinardus, in his discussion of the results of the 'Gauss' Expedition. Lockyer's scheme shows a series of cyclones revolving round an Antarctic Anticyclone, and having their centres about 60° S. Meinardus' scheme is similar, but he raises objections to the existence of an Antarctic Anticyclone, chiefly on the ground that under anticyclonic conditions evaporation exceeds precipitation. Dr. Simpson showed diagrams based on the "Gauss'" observations, in which large variations of pressure were accompanied by no change in the direction of the wind, although it was blowing with gale force on many occasions. Such results are not consistent with a series of cyclones travelling from west to east, and, taken in conjunction with other evidence, indicate the inadequacy of the existing theories of the general circulation of the atmosphere in the Southern Hemisphere. He showed also, from the results of balloon ascents, that the vertical temperature gradient in calm weather was such that the lower air if it had descended from above would, if forced to rise again, reach the condensation point at a much lower level, and his opinion was that such forcible rising did take place in blizzards. There blizzards arise through the large difference between the temperature of the air over the Ross Sea, and of that over the Barrier. The differences amount to as much as 15° C., and owing to them a gradient of pressure is established which brings about an east wind, and at

the western side, owing to the great mountian barrier, a south-east wind. He deduces from these considerations that anti-cyclonic conditions are consistent with an excess of precipitation.

An examination of monthly means of pressure at Cape Evans and in Australia revealed the existence of a large negative corre lation, which afforded an additional reason for the establishment of a permanent meteorological station on the Antarctic Continent.

Mr. Hunt congratulated Dr. Simpson on the lucid exposition which he had given of Antarctic Meteorology. He himself thought that the persistent east wind at the Gauss quarters was not conclusive evidence that it was not associated with a cyclone, because the wind on the south side of a cyclone would be from the east.

Captain J. K. Davis spoke of the importance of taking into account the influence of floating ice in the Antarctic Seas. Great variations in this were found to occur and they could not but be associated with corresponding meteorological variations.

Mr. Griffith Taylor laid stress upon the contrast between the North and South Polar regions, and he thought that the controlling factor in Antarctic meteorology was the great Antarctic plateau.

Mr. Ferrar said that his observations on the " Discovery Expedition " bore out Dr. Simpson's conclusion regarding the temperature " escarpment " between the Barrier and the Ross Sea. He also observed that there was less snow present at the place of observation in February, 1904, than there was two years earlier, and, although this seemed to point to an excess of evaporation, he agreed that it could not be taken as evidence of general excess of evaporation over precipitation, which, if it existed, would have rendered South Victoria Land a bare land surface.

Mr. Gold referred to the changes of pressure without change of wind at the Gauss' quarters, and pointed out that such differences of temperature as were found between land and sea would result in a straightening and closing up of the isobars of a cyclone along the coast. An effect of this kind, combined with a motion of the cyclone in a south-easterly direction, might furnish the clue to the difficulty. He congratulated Dr. Simpson on having taken scientific account of the effect of the mountain ranges in controlling the direction of the air motion, thus, for the first time, substituting for the loose expression " physiographic influence," a definite reasoned argument.

An important communication was made by Prof. H. H. Turner in a paper entitled " Discontinuities in Meteorological Phenomena." He found that roughly every seven years the periodicity of various series of temperatures and rainfall changed. The periods were not exactly seven years, but themselves varied from 5·4 to 7·3 years; the maximum of 7·3 years was reached about every 41 years, after which the period diminished again. He found, on examination, that the movements of the earth's axis fit in well with this variation

of period, and incidentally he had discovered that a period of 41 years fitted Brückner's results better than the period of 35 years previously assigned. The minimum periods of about five years occurred about 1736, 1774, 1818, 1857, 1900, and these might be regarded as critical years. The complete series of periods is—

Adopted Dates of Discontinuity.

1730·6	1800·4	1882·7
1736·0	1813·0	1889·4
1741·6	*1818·3*	1895·2
1748·2	1823·9	*1900·6*
1755·5	1830·4	1906·2
1762·7	1837·8	1912·7
1769·0	1845·0	1920·1
1774·5	1851·4	
1779·8	*1856·7*	
1786·0	1862·1	
1792·9	1868·2	
	1875·3	

During the intervals between consecutive dates in the table the periodicity remains constant, but different from that in the next interval.

Dr. Simpson said that he had been much interested in the paper, but it was too complex for him to venture to offer criticism until he had time to look into the questions which it raised.

Mr. Gold trusted that Prof. Turner's results would find application to the problem confronting Australian meteorologists. He would like to know what were the magnitudes of the variations with which Prof. Turner had been dealing, because their usefulness depended on whether the amplitudes, in the case of rainfall, were fractions of an inch or comparable with the differences between a good year and a bad year.

In reply Prof. Turner said that the paper was still in the making, but the variations were roughly about 10 per cent. to 20 per cent. of the totals.

Mr. H. A. Hunt read a paper on Australian Rainfall before the Geographical Section, which he illustrated by a relief model of Australia, in which the vertical heights represented the amount of rainfall. The model displayed the distribution of rainfall even more effectively than a coloured chart.

Sir Oliver Lodge read a paper on "The Artificial Electrification of the Atmosphere," before the Engineering Section, and suggested that rain might be produced by this means. Dr. Simpson expressed his disagreement with the view that considerable condensation could be brought about in such a manner.

Among other papers of interest to meteorologists were a discussion on the "Physiography of Arid Lands," opened by Sir T. Holland; "Forest Climate and Rainfall," by Mr. Mackay; "Climate in the Pleistocene Age," by Prof. Gunnar Andersson; and "Climate from the Physiological Point of View," by Prof. W. A. Osborne.

THE PRACTICAL UTILITY OF A WORLD BUREAU OF METEOROLOGY.

By W. M. HAYS and H. H. CLAYTON.

OUR suggestions attempt to cover two objects, the first being to increase materially the value of the crop estimates of each country, and also of the Institute's world area estimates by taking account of the influences of meteorological happenings as soon after their occurrences as possible. The second is to unify and greatly improve the meteorological service of each country and of the entire world.

The first suggestion provides for the use of weather reports as bases for estimates of the effect of weather changes on crops. This is intended to improve upon the present plan of allowing private agencies to take immediate estimates of changes in crop prospects based on weather changes, while the public agencies ponderously wait until the changes are fully wrought out in the appearance of the crop.

The second suggestion has taken the form of a project for a World Meteorological Bureau, beside the Statistical Bureau in the International Institute of Agriculture.

The two propositions are closely related and interdependent. For the making of crop estimates as dependent on meteorological occurences it is essential to collect information of meteorological conditions. The study of these by trained experts in the manner suggested will permit of constantly increasing efficiency in crop estimates by establishing more exact relations between meteorological occurences and the crop growth, besides advancing the science of meteorology, in other ways.

Furthermore, with the assembled information properly treated, it will be possible to forecast coming meteorological changes, and these forecasts will permit the provisional estimate of crop condition in advance of occurrence, such estimates may, in time, prove of great value. They are already made now by private interests but in a crude way.

Since reports of meteorological conditions are gathered daily by wire, they serve as an immediate basis for predicting changes in crop yields from meteorological changes which have already occurred but not yet manifested themselves in a changed condition of crop.

Estimates of crop condition, based on reports made by growers and by bureau agencies are expensive, can be made only periodically, and are mainly records of effects of climatic changes some time past, their effect being already wrought out in the changed conditions of the crops.

Periodical estimates, based on observed conditions, giving acreage and excellence of the crop, are necessarily made at wide intervals.

A census of acreage, or at least a careful estimate, is a first necessity in estimating the crop products, in the terms of bushels or tons. When the crop has its growth well begun, an estimate of the excellence of the growth is also necessary. This can be made in percentage for each county, state, and nation, and for the world area. Under this plan the Bureau of Statistics of the United States Department of Agriculture can correct its plan of attempting monthly to give belated estimates of conditions, by making these "basal estimates" at wider intervals, and by using the daily telegrams of its weather reporting agencies as bases for "immediate estimates" wherever the exigencies of the occasion warrant raising or lowering. the single numerical figure representing the "basal estimates" of crop conditions. The Bureau of Statistics of the Argentine Ministry of Agriculture with its less frequent "basal estimates" will likewise be able simply to add "immediate estimates" based on the daily reports of the widely distributed agencies of its Weather Bureau.

The weather is the one great varying factor in crop production. By using the local records of temperature and rainfall and of destructive storms, prospects of crops can be foretold, often before the crops themselves indicate results of the climatic changes.

Even periodical invasions and movements of locusts and other migratory insects may be somewhat estimated from the effect of weather conditions on the insects and on their enemies.

International telegrams of weather conditions are already being collected by the national bureaus for use in foretelling and forecasting. The Indian Meteorological Service has been making seasonal forecasts of the weather for several years, based on information received from Australia, the Indian Ocean, Africa, Siberia, and South America, in correlation with the information obtained in India.

Similar season forecasts are in contemplation in Australia by the Commonwealth Bureau of Meteorology.

In the United States the Weather Bureau is now making forecasts for a week, based on daily telegrams received from Asia, Europe, the Azores, and some wireless reports from vessels at sea.

In Argentina the *Oficina Meteorologica* is collecting weather data daily by telegraph from Chili, Argentina, and Brazil, and contemplates extending the service to Bolivia and Peru.

All these reports could no doubt be concentrated at a Central Office with little expense by the courtesy of exchanging information and then be at the service of the International Institute of Agriculture, and of all the Weather Bureaus of the world.

These reports and all similar information which could be assembled quickly at a central bureau of meteorology could be charted and summarised at the Central Office; and such facts telegraphed to each country as would be of immediate service to that particular

country. In fact, at a comparatively small cost, it would be possible to telegraph to each country an outline map of world conditions. Both England and Germany publish international charts once a week or once in ten days, and the urgent need of an International Bureau or Clearing House of meteorological information, especially of current conditions, has been expressed by the leading meteorologists of England, Germany, and France.

Dr W. N. Shaw, Chief of the English Weather Service, when writing of the question of solar meteorological work says :—

" One plan of dealing with the results of solar research from the special point of view of weather would be to place (by publication or otherwise) all the solar data at the disposal of each of the contributing countries, and let them do what they think best about correlating them with weather data. This would mean independent appeals for meteorological data from all over the world, independent staff working at the same general problem, and incoordinated attacks upon the general problem. Whereas if the attack on the general problem is made the business of a centralised institution which can take up the line that seems to promise the best results, irrespective, in the first instance, of the special relation to this or that particular country, it is probable that success for each country will be accelerated.

Consequently, as it seems to me, a central bureau for dealing with the correlation of the weather data for the earth in general is almost a necessary correlative of a complete scheme of solar observations in which governments unite. I do not know that any single office not specially charged with this duty would like to take it on on its own account. We have all of us local claims upon the resources that keep us within a more limited horizon than the weather changes of the world at large, though perhaps each one of us would admit that if we had the pluck to embark upon a twenty year's enterprise of this kind we might do better in the end than simply ploughing our own furrow over and over again." *

These expressions of Dr. Shaw apply in the same force with regard to the relation of agricultural conditions to meteorological happenings as they do to the solar conditions. In " Nature " of February 26th, 1914, Dr. Shaw expresses the great desirability of " a daily weather map of the main features of the distribution of pressure and temperature over the globe."

Dr. Hellmann, Director of the Royal Prussian Meteorological Institute, has said that " if our knowledge of meteorology is to advance, daily or short periodical maps of the world would have to be made."

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* *Report upon Observations made during an Official Visit to Europe, Asia and America. By H. A. Hunt, Commonwealth Meteorologist of Australia.*

Correspondence.

To the Editor of Symons's Meteorological Magazine.

VISIBILITY.

These notes constitute a summary of my experiences :—

1. Sunshine, especially in fine warm weather, is often fatal to effective observation.

2. Sunshine over a large body of water, such as the Severn Sea, is even more obstructive. Vapour is raised by the solar heat, and this vapour is likely to be partially condensed, by the passage of relatively cold currents from above, into thin whitish mist or haze. Moreover, the glare of sunshine on the whitish veil is distressing.

3. Anti-cyclones are distinctly bad—generally quite "hopeless." I think, however, that a fair degree of clearness may sometimes be enjoyed a little inside or outside of the edge of one of these formations, when a depression is advancing, the isobars lying more "amicably close," and the wind inclined to strengthen.

4. Mr. Marriott contends that vapour has little or nothing to do with the question of visibility. My experience seems to prove that the clearest horizons are found in cloudy, more or less showerful, but not necessarily dull, weather. Mr. Marriott refers to the difference between the dry and the wet bulb readings; but rain sometimes falls through a fairly dry atmosphere; and such weather may be found conducive to visibility, other matters being favourable.

5. The best winds, in respect of clear horizons, are generally those between west and north. The south-west is not always bad, but often *imports* vapour from a distance.

6. The worst winds are usually those between north-north-east and east-south-east. I am inclined to think that the south-east wind is variable.

7. The greatest success of my life, in respect of the observation of distances, was obtained some years ago in rather unsettled weather, and (I think) as late in the season as the first week of October. I was on the Wrekin, in Shropshire. I noticed, in a north by westerly direction, a bold and very remote group of hills, undoubtedly the mountains of Westmorland, distant about 125 miles. I think rain fell at Wellington a little before or a little after my discovery; and the Westmorland mountains themselves did not seem to be perfectly clear. It is plain, I think, that *humidity* was a factor in my success. I have no reason to suppose that the wind was noticeably high on that day.

Another instance I may mention of the coincidence of "humidity" (precipitation) with a unusual degree of atmospheric clearness. On the 29th of December, 1912, a hail-storm of great severity came on

near Ilfracombe, and land and sea-scapes were blotted out in gloom so profound that only the nearer features could be discerned. This condition lasted but a brief time; before I could reach the town, the local elevations, the Channel and the coast and mountains of South Wales were clearly revealed, while the great dome of Mynydd Presceli (the highest land in Pembrokeshire), heaved boldly against the north-westerly sky, at the distance of sixty miles. I think the wind was northerly or north-westerly.

E. G. ALDRIDGE, F.R.Met.Soc.

Barnstaple, 8th September, 1914.

WET AND DRY PERIODS.

I SHOULD like to call attention to two rather remarkable periods of, respectively, wet and dry weather this year here, which are obscured by the returns being made in monthly terms :—

February 22nd to April 6th	... 59 days	... 8·40 in.
July 9th to October 12th	... 82 days	... 1·75 in.

Neither I nor a neighbour, who is a large farmer and the same age as myself (81), can remember to have seen the country so dry in mid-October.

ALFRED O. WALKER.

Ulcombe Place, Nr. Maidstone, November 1st, 1914.

ABSOLUTE DROUGHT.

WE have just suffered from an absolute drought of eighteen days, August 26th to September 11th, and a partial drought of thirty-four days, August 8th to September 11th, when only ·19 of an inch fell; coming, as it did, at the end of summer, our rainwater tanks soon emptied, and the pond, the source of the drinking water supply, got very low indeed, reducing the depth of the well, which it feeds, from $2\frac{3}{4}$ feet to 5 inches, so that the pump was powerless. And yet this has not been by any means a very hot summer, though the nights have been unusually warm; we had a minimum of 62° on the night of the 7th-8th September, and 61° on the 9th-10th; altogether fourteen minimum readings of 60° or over, which must be unusual, from the 1st July to the 10th September. Whereas we only had three maxima of 80°, all in July.

I may mention that I know of a publican in a village near here, who has to send for water, all the year round, to the nearest town, two miles away. He makes a cask last a week.

HUBERT SATCHELL.

Shady Camp Vicarage, Bartlow, S. Cambs.

THERMOMETER VARIATIONS,

A REMARKABLE case of the wet bulb thermometer reading higher than the dry bulb occurred here at the end of September. I should like to bring it to the notice of your readers in order to learn whether anyone else has experienced a similar fault. The reading occurred on September 30th, at 7 a.m., in a calm atmosphere with some ground fog in places. The air was saturated at the time as indicated by the hair hygrograph. The readings were, dry bulb, 28°·7, wet, 31°·3, and as I was taking the morning observations myself and at once noticed the peculiarity I feel confident that it was not an error in reading. The record from the thermograph showed that the temperature had been below freezing since about 1 a.m., so that plenty of time had elapsed for the water to freeze on the bulb. However to make sure that it was not a case of the sudden freezing of supercooled water, I waited by the screen for fifteen minutes and fanned the instrument at intervals, but without producing any reduction of the reading.

The only explanation which seems possible is that for some reason the mercury column had broken, leaving the upper portion standing at 31°·3. A recent attempt to get such an effect by slowly reducing the temperature of the bulb from 32° to 31° by artificial means has proved fruitless, and on one occasion in October also the reading went below 31° in a normal manner, so that it seems as though the fault is not likely to be repeated.

The thermometer has a correction of —0°·2. Thus the corrected temperature at which it stuck was very close to 31°.

J. S. DINES.

Meteorological Office, South Farnborough, Hants.

TEMPERATURE DURING ECLIPSE.

I NOTICE in your last issue a note by Mr. R. H. Curtis with reference to "Temperature during partial Solar Eclipse." The following readings were taken by my assistant and checked by me.

Dry bulb reading in Stevenson's Screen : Highest, 72° ; Lowest, 65° ; Maximum fall, 7°.

Readings taken from delicate chemical thermometer, hung 60 ft. away from any buildings, 3 ft. from ground in direct sunlight.

11.18 a.m.	11.25	11.40	11.55	0.18 p.m.	0.45	Total fall
81°	72°	70°	69°	68°	69°	13°

The readings were taken to the nearest degree.

S. ALLINSON WOODHEAD, M.Sc.

Agricultural & Horticultural College, Uckfield, Sussex, October 19th, 1914.

SEASONAL LIMITS.

I HAVE for some time past been led very gradually to the conclusion that the Seasonal limits adopted for meteorological purposes are imperfect and need drastic revision. Under the present system the Spring is (as is well-known), represented by the months March, April and May; the Summer by June, July, and August; the Autumn by September, October, and November; and the Winter by December, January, and February. The common practice of grouping the weather into monthly periods seems to have lured us into ways which are, in many respects, indefensible.

I would submit, in the first place, that in this country, at all events, the various Seasons are not of equal length. Typical Summer weather and typical Winter weather (when we get it), usually lasts for more than three months at a stretch. Typical Spring and Autumn weather is, on the other hand, of far shorter duration.

In order to effect some more rational arrangement it is, I think, necessary to abandon the monthly grouping altogether and to substitute for it periods bounded by weeks, assigning, moreover, a longer period to the Summer and Winter than to the Spring and Autumn. The desirability of the change may be illustrated by a few recent examples :—

(*a.*) The extremely wet Winter of 1911-12 lasted until the middle of March. Under the existing system the heavy rains which fell during the first half of that month were credited, not to the Winter, but to the following Spring, which was otherwise a dry Season.

(*b.*) The magnificent Summer weather of 1911 continued until the middle of September, but owing to our defective method of classification the shade temperatures of 90° and upwards which were recorded in many parts of England in the earlier half of that month were credited, erroneously, as I submit, to the succeeding Autumn.

(*c.*) Going still further back we may instance the severe frost which occurred in the first week of March in 1909. The temperatures then recorded were lower than any observed in December, January, or February, but a strict adherence to the ordinary monthly and seasonal classification led to an assignment of the cold weather to the Spring season, not to the Winter, to which it properly belonged.

By a re-arrangement of the seasonal limits such cases of overlapping would, in nearly every instance, be avoided. In order to effect this I would suggest that the 52 weeks of the year be divided into two periods of 17 weeks each, representing the Summer and Winter, and two periods of 9 weeks each, representing the Spring and Autumn. In this way the Spring would comprise the 11th to 19th weeks of the year, running from about the middle of March to

the middle of May; the Summer the 20th to 36th weeks, running from the middle of May to the middle of September; the Autumn the 37th to 45th weeks, running from the middle of September to the middle of November; and the Winter the 46th week of one year to the 10th week of the following year, running from the middle of November to the middle of March. The Summer and Winter Seasons would, in this way, be lengthened at each end by a fortnight; while the Spring and Autumn Seasons would be correspondingly reduced. There would, at the same time, be no occasion to abandon entirely the conventional monthly classification, which has received international sanction, and is undoubtedly in some ways convenient.

For the purpose of comparison with the average the employment of Seasonal periods of unequal length would necessitate the use of percentages in place of differences, a method which has, I think, for some time past, commended itself to the notice of careful workers. The total rainfall, for example, in the Spring and Autumn Seasons, would usually be smaller than in the Summer and Winter, so that to quote the actual amount or the difference from the average in inches and parts of inches would give misleading results. By the employment of percentages the difficulty would be easily overcome.

The new classification I suggest may possibly seem too revolutionary to admit of general adoption, and the views of practical meteorological workers on this point is therefore invited. You may feel disposed to spare some space for a discussion of the subject.

FREDK. J. BRODIE.

12, Patten Road, Wandsworth Common, 23rd Oct., 1914.

LONG PARTIAL DROUGHT.

THE following particulars of the long partial drought may be of interest :—

Sept. 21	Oct. 1	Oct. 4	Oct. 8	Oct. 21	Oct. 22	...	35 days
·01 in.	·07 in.	·01 in.	·02 in.	·02 in.	·06 in.	...	·19 in.

October 25th gave ·50 in. and October 26th, ·13 in.

W. F. VINT.

Cedars-End, Sunderland, October 27th, 1914.

RAINFALL TABLE FOR OCTOBER, 1914.

STATION.	COUNTY.	Lat. N.	Long. W. [*E.]	Height above Sea.	RAINFALL OF MONTH.	
					Aver. 1875—1909.	1914.
		° ′	° ′	ft.	in.	in.
Camden Square	*London*	51 32	0 8	111	2·72	1·25
Tenterden	*Kent*	51 4	*0 41	190	3·48	3·43
Arundel (Patching)	*Sussex*	50 51	0 27	130	4·01	2·87
Fawley (Cadland)	*Hampshire*	50 50	1 22	52	4·07	3·22
Oxford (Magdalen College)	*Oxfordshire*	51 45	1 15	186	2·82	2·80
Wellingborough (Croyland Abbey)	*Northampton*	52 18	0 41	174	2·61	...
Shoeburyness	*Essex*	51 31	*0 48	13	2·31	1·93
Bury St. Edmunds (Westley)	*Suffolk*	52 15	*0 40	226	2·72	1·96
Geldeston [Beccles]	*Norfolk*	52 27	*1 31	38	2·84	2·44
Polapit Tamar [Launceston]	*Devon*	50 40	4 22	315	4·84	2·96
Rousdon [Lyme Regis]	,,	50 41	3 0	516	3·81	3·86
Stroud (Upfield)	*Gloucestershire*	51 44	2 13	226	3·21	1·95
Church Stretton (Wolstaston)	*Shropshire*	52 35	2 48	800	3·77	2·10
Coventry (Kingswood)	*Warwickshire*	52 24	1 30	340	3·20	1·94
Boston	*Lincolnshire*	52 58	0 1	11	2·75	2·08
Worksop (Hodsock Priory)	*Nottinghamshire*	53 22	1 5	56	2·77	2·43
Macclesfield	*Cheshire*	53 15	2 7	501	3·53	1·84
Southport (Hesketh Park)	*Lancashire*	53 39	2 59	38	3·74	2·47
Arncliffe Vicarage	*Yorkshire, W.R.*	54 8	2 6	732	6·48	3·07
Wetherby (Ribston Hall)	,, ,,	53 59	1 24	130	3·18	1·93
Hull (Pearson Park)	,, *E.R.*	53 45	0 20	6	3·19	2·27
Newcastle (Town Moor)	*Northumberland*	54 59	1 38	201	3·20	2·40
Borrowdale (Seathwaite)	*Cumberland*	54 30	3 10	423	12·71	3·46
Cardiff (Ely)	*Glamorgan*	51 29	3 13	53	4·87	2·50
Haverfordwest	*Pembroke*	51 48	4 58	90	5·51	2·75
Aberystwyth (Gogerddan)	*Cardigan*	52 26	4 1	83	5·38	1·54
Llandudno	*Carnarvon*	53 20	3 50	72	3·78	1·21
Cargen [Dumfries]	*Kirkcudbright*	55 2	3 37	80	4·45	1·44
Marchmont House	*Berwick*	55 44	2 24	498	3·83	2·20
Girvan (Pinmore)	*Ayr*	55 10	4 49	207	5·38	2·21
Glasgow (Queen's Park)	*Renfrew*	55 53	4 18	144	3·36	1·17
Inveraray (Newtown)	*Argyll*	56 14	5 4	17	6·50	2·94
Mull (Quinish)	,,	56 34	6 13	35	5·87	2·95
Dundee (Eastern Necropolis)	*Forfar*	56 28	2 57	199	2·81	2·42
Braemar	*Aberdeen*	57 0	3 24	1114	3·88	2·23
Aberdeen (Cranford)	,,	57 8	2 7	120	3·23	3·07
Cawdor	*Nairn*	57 31	3 57	250	2·95	·83
Fort Augustus (S. Benedict's)	*E. Inverness*	57 9	4 41	68	4·14	·79
Loch Torridon (Bendamph)	*W. Ross*	57 32	5 32	20	8·38	3·10
Dunrobin Castle	*Sutherland*	57 59	3 56	14	3·15	1·44
Wick	*Caithness*	58 26	3 6	77	3·14	1·92
Killarney (District Asylum)	*Kerry*	52 4	9 31	178	5·59	3·39
Waterford (Brook Lodge)	*Waterford*	52 15	7 7	104	4·00	2·14
Nenagh (Castle Lough)	*Tipperary*	52 54	8 24	120	3·48	2·48
Ennistymon House	*Clare*	52 57	9 18	37	4·40	2·77
Gorey (Courtown House)	*Wexford*	52 40	6 13	80	3·75	2·30
Abbey Leix (Blandsfort)	*Queen's County*	52 56	7 17	532	3·53	1·84
Dublin (Fitz William Square)	*Dublin*	53 21	6 14	54	2·88	1·24
Mullingar (Belvedere)	*Westmeath*	53 29	7 22	367	3·19	1·17
Crossmolina (Enniscoe)	*Mayo*	54 4	9 16	74	5·27	3·29
Cong (The Glebe)	,,	53 33	9 16	112	4·60	2·54
Collooney (Markree Obsy.)	*Sligo*	54 11	8 27	127	4·21	2·12
Seaforde	*Down*	54 19	5 50	180	3·65	1·63
Bushmills (Dundarave)	*Antrim*	55 12	6 30	162	3·60	1·81
Omagh (Edenfel)	*Tyrone*	54 36	7 18	280	3·76	1·76

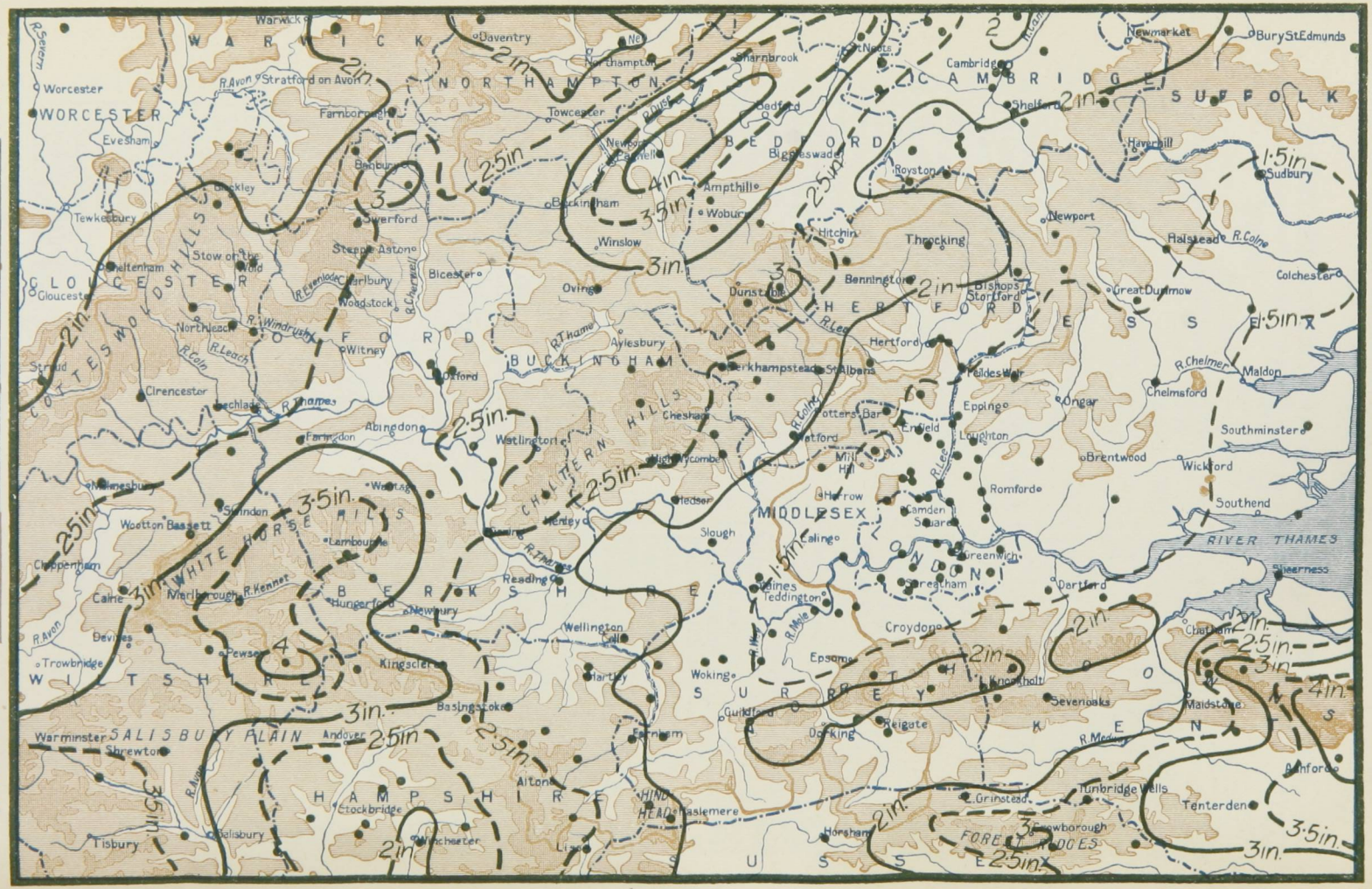
RAINFALL TABLE FOR OCTOBER, 1914—*continued.*

RAINFALL OF MONTH (*con.*)					RAINFALL FROM JAN. 1.					
Diff. from Av. in.	% of Av.	Max. in 24 hours. in.	Max. in 24 hours. Date.	No. of Days	Aver. 1875—1909. in.	1914. in.	Diff. from Aver. in.	% of Av.	Mean Annual 1875-1909. in.	STATION.
—1·47	46	·28	25	13	20·64	15·88	—4·76	77	25·11	Camden Square
— ·05	99	1·23	29	16	21·80	20·82	— ·98	96	27·64	Tenterden
—1·14	72	·60	29	14	24·03	22·18	—1·85	92	30·48	Patching
— ·85	79	·77	28	16	25·25	25·03	— ·22	99	31·87	Cadland
— ·02	99	·87	14	12	20·27	19·23	—1·04	95	24·58	Oxford
...	...	...	...	...	20·81	...	..	...	25·17	Croyland Abbey
— ·38	84	·59	29	14	15·48	13·31	—2·17	86	19·28	Shoeburyness
— ·76	72	·53	25	14	20·86	17·74	—3·12	85	25·40	Westley
— ·40	86	·66	29	24	19·17	16·14	—3·03	84	23·73	Geldeston
—1·88	61	·51	31	15	29·74	33·67	+3·93	113	38·27	Polapit Tamar
+ ·05	101	·79	31	16	26·35	31·21	+4·86	118	33·54	Rousdon
—1·26	61	·37	14	13	24·33	21·49	—2·84	88	29·81	Stroud
—1·67	56	·54	26	15	26·48	23·53	—2·95	89	32·41	Wolstaston
—1·26	61	·39	25	14	23·71	16·10	—7·61	68	28·98	Coventry
— ·67	76	·50	25	18	19·42	15·27	—4·15	79	23·35	Boston
— ·34	88	·52	25	14	20·31	15·19	—5·12	75	24·46	Hodsock Priory
—1·69	52	·76	25	12	28·38	29·22	+ ·84	103	34·73	Macclesfield
—1·27	66	·79	25	9	26·44	23·46	—2·98	89	32·70	Southport
—3·41	47	1·04	25	15	48·62	41·09	—7·53	85	61·49	Arncliffe
—1·25	61	·60	25	9	22·26	18·79	—3·47	84	26·87	Ribston Hall
— ·92	71	·66	25	13	21·76	17·75	—4·01	82	26·42	Hull
— ·80	75	·69	29	15	22·85	20·50	—2·35	90	27·94	Newcastle
—9·25	27	1·03	25	13	100·75	87·55	—13·20	87	129·48	Seathwaite
—2·37	51	·70	25	13	33·50	36·60	+3·10	109	42·28	Cardiff
—2·76	50	·77	25	13	36·47	35·91	— ·56	98	46·81	Haverfordwest
—3·84	29	·48	25	17	36·30	34·76	—1·54	96	45·46	Gogerddan
—2·57	32	·57	25	12	24·33	20·83	—3·50	86	30·36	Llandudno
—3·01	32	·83	25	10	34·28	32·02	—2·26	93	43·47	Cargen
—1·63	57	·60	25	18	27·72	19·40	—8·32	70	33·76	Marchmont
—3·17	41	·98	25	13	39·05	38·08	— ·97	98	49·77	Girvan
—2·19	35	·47	25	14	28·39	23·83	—4·56	84	35·97	Glasgow
—3·56	45	·50	2, 26	17	52·71	52·20	— ·51	99	68·67	Inveraray
—2·92	50	·43	27	17	43·74	39·92	—3·82	91	56·57	Quinish
— ·39	86	·50	25	17	23·35	18·91	—4·44	81	28·64	Dundee
—1·65	58	·49	29	15	28·04	23·94	—4·10	85	34·93	Braemar
— ·16	95	·58	25	18	26·01	20·95	—5·06	81	32·73	Aberdeen
—2·12	28	·46	26	2	24·20	19·34	—4·86	80	29·33	Cawdor
—3·35	19	·26	26	11	34·40	26·86	—7·54	78	44·53	Fort Augustus
—5·28	37	·61	5	16	65·17	69·50	+4·33	107	83·93	Bendamph
—1·71	46	·49	25	15	25·56	22·57	—2·99	88	31·90	Dunrobin Castle
—1·22	61	..	...	...	23·82	21·34	—2·48	90	29·88	Wick
—2·20	61	·83	28	12	42·35	47·33	+4·98	112	54·81	Killarney
—1·86	54	·62	25	10	31·45	28·01	—3·44	89	39·57	Waterford
—1·00	71	·54	27	10	31·21	30·24	— ·97	97	39·43	Castle Lough
—1·63	63	·57	11	13	36·87	39·89	+3·02	108	46·52	Ennistymon
—1·45	61	·70	25	11	28·16	25·00	—3·16	89	34·99	Courtown Ho.
—1·69	52	·52	31	11	29·23	27·72	—1·51	95	35·92	Abbey Leix
—1·64	43	·48	31	12	22·77	17·06	—5·71	75	27·68	Dublin
—2·02	37	·47	31	9	29·38	27·75	—1·63	94	36·15	Mullingar
—1·98	62	·67	24	16	41·01	39·88	—1·13	97	52·87	Enniscoe
—2·06	55	·76	25	11	38·48	38·85	+ ·37	101	48·90	Cong
—2·09	50	·84	25	16	34·35	34·75	+ ·40	101	42·71	Markree
—2·02	45	·78	25	7	31·28	24·44	—6·84	78	38·91	Seaforde
—1·79	50	·81	25	15	29·92	25·58	—4·34	86	37·56	Dundarave
—2·00	47	·72	25	15	31·81	29·16	—2·65	92	39·38	Omagh

SUPPLEMENTARY RAINFALL, OCTOBER, 1914.

Div.	STATION.	Rain inches.	Div.	STATION.	Rain inches.
II.	Warlingham, Redvers Road..	2·12	XI.	Lligwy	1·38
,,	Ramsgate	3·37	,,	Douglas	1·91
,,	Hailsham	2·61	XII.	Stoneykirk, Ardwell House...	2·16
,,	Totland Bay, Aston House...	3·78	,,	Dalry, The Old Garroch.....	...
,,	Stockbridge, Ashley..	2·32	,,	Beattock, Kinnelhead	2·28
,,	Grayshott	2·31	,,	Langholm, Drove Road	1·42
III.	Harrow Weald, Hill House...	1·73	XIII.	Meggat Water, Cramilt Lodge	1·68
,,	Caversham, Rectory Road ...	2·07	,,	North Berwick Reservoir.....	2·07
,,	Pitsford, Sedgebrook...	1·89	,,	Edinburgh, Royal Observaty.	1·23
,,	Woburn, Milton Bryant.....	3·27	XIV.	Maybole, Knockdon Farm ...	1·56
,,	Chatteris, The Priory..... ...	2·32	XV.	Ballachulish House	3·00
IV.	Elsenham, Gaunts End	1·51	,,	Campbeltown, Witchburn ..	2·48
,,	Colchester, Hill Ho., Lexden	1·28	,,	Holy Loch, Ardnadam.....	3·56
,,	Ipswich, Rookwood, Copdock	1·89	,,	Islay, Eallabus	3·33
,,	Blakeney.....	1·43	,,	Tiree, Cornaigmore	3·01
,,	Swaffham	2·05	XVI.	Dollar Academy	1·98
V.	Bishops Cannings	3·28	,,	Balquhidder, Stronvar.....	2·22
,,	Wimborne, St. John's Hill ...	3·42	,,	Glenlyon, Meggernie Castle..	1·85
,,	Ashburton, Druid House.....	4·14	,,	Blair Atholl	1·34
,,	Cullompton	3·71	,,	Coupar Angus	2·51
,,	Lynmouth, Rock House	3·80	,,	Montrose, Sunnyside Asylum.	2·78
,,	Okehampton, Oaklands... ...	4·18	XVII.	Alford, Lynturk Manse	3·47
,,	Hartland Abbey.....	2·52	,,	Fyvie Castle	3·34
,,	Probus, Lamellyn.....	3·30	,,	Keith Station	2·41
,,	North Cadbury Rectory.....	2·71	XVIII.	Rothiemurchus	·93
VI.	Clifton, Pembroke Road.....	2·06	,,	Loch Quoich, Loan	5·40
,,	Ross, The Graig	1·81	,,	Drumnadrochit	·71
,,	Shifnal, Hatton Grange.....	1·59	,,	Skye, Dunvegan	4·86
,,	Droitwich.....	1·70	,,	Lochmaddy, Bayhead	2·77
,,	Blockley, Upton Wold.....	2·07	,,	Glencarron Lodge	2·60
VII.	Market Overton.....	2·76	XIX.	Invershin	1·12
,,	Market Rasen	2·08	,,	Melvich	2·31
,,	Bawtry, Hesley Hall	2·05	,,	Loch Stack, Ardchullin	4·19
,,	Derby, Midland Railway.....	1·99	XX.	Skibbereen Rectory	2·71
,,	Buxton	3·18	,,	Dunmanway, The Rectory ..	2·86
VIII.	Nantwich, Dorfold Hall	1·23	,,	Glanmire, Lota Lodge.....	1·50
,,	Chatburn, Middlewood	2·04	,,	Mitchelstown Castle.....	1·37
,,	Cartmel, Flookburgh	..	,,	Darrynane Abbey.....	3·78
IX.	Langsett Moor, Up. Midhope	2·72	,,	Clonmel, Bruce Villa	1·65
,,	Scarborough, Scalby	2·22	,,	Newmarket-on-Fergus, Fenloe	2·17
,,	Ingleby Greenhow	2·80	XXI.	Laragh, Glendalough	1·76
,,	Mickleton	2·25	,,	Ballycumber, Moorock Lodge	1·75
X.	Bellingham, High Green Manor	2·32	,,	Balbriggan, Ardgillan	2·05
,,	Ilderton, Lilburn Cottage ...	2·49	XXII.	Woodlawn	1.72
,,	Keswick, The Bank.....	1·43	,,	Westport, St. Helens	2·81
XI.	Llanfrechfa Grange	2·94	,,	Dugort, Slievemore Hotel ...	3·40
,,	Treherbert, Tyn-y-waun	4·73	,,	Mohill Rectory	2·16
,,	Carmarthen, The Friary	2·56	XXIII.	Enniskillen, Portora.....	1·80
,,	Castle Malgwyn [Llechryd]...	..	,,	Dartrey [Cootehill]	2·23
,,	Crickhowell, Tal-y-maes.....	4·30	,,	Warrenpoint, Manor House ..	2·27
,,	New Radnor, Ednol	3·10	,,	Banbridge, Milltown	1·18
,,	Birmingham WW., Tyrmynydd	3·44	,,	Belfast, Cave Hill Road	1·85
,,	Lake Vyrnwy	2·16	,,	Glenarm Castle..... ...	...
,,	Llangyhanfal, Plâs Draw.....	1·74	,,	Londonderry, Creggan Res...	1·73
,,	Dolgelly, Bryntirion.....	1·58	,,	Dunfanaghy, Horn Head ...	2·10
,,	Bettws-y-Coed, Tyn-y-bryn...	2·56	,,	Killybegs	3·23

THAMES VALLEY RAINFALL. — OCTOBER, 1914.


ALTITUDE SCALE
Below 250 feet
250 to 500 feet
500 to 1000 feet
Above 1000 feet
SCALE OF MILES
0 5 10 15 20
WORCESTER
GLOUCESTER
WARWICK
NORTHAMPTON
BEDFORD
CAMBRIDGE
SUFFOLK
OXFORD
BUCKINGHAM
HERTFORD
ESSEX
MIDDLESEX
LONDON
BERKSHIRE
WILTSHIRE
SURREY
KENT
HAMPSHIRE
SUSSEX
COTSWOLD HILLS
CHILTERN HILLS
WHITE HORSE HILLS
SALISBURY PLAIN
FOREST ROCKS
RIVER THAMES
Worcester
Evesham
Stratford on Avon
Daventry
Towcester
Farnborough
Banbury
Bicester
Oxford
Witney
Woodstock
Cirencester
Northleach
Stow on the Wold
Cheltenham
Gloucester
Stroud
Tewkesbury
Abingdon
Wantage
Faringdon
Wallingford
Wantage
Lambourn
Hungerford
Newbury
Reading
Basingstoke
Andover
Salisbury
Warminster
Shrewton
Trowbridge
Devizes
Calne
Marlborough
Swindon
Wootton Bassett
Malmesbury
Chippenham
Pewsey
Kingsclere
Hartley
Winchester
Stockbridge
Alton
Aylesbury
Buckingham
Winslow
Wolverton
Newport Pagnell
Olney
Towcester
Northampton
Daventry
Rugby
Leamington
Warwick
Stratford on Avon
Evesham
Worcester
Tewkesbury
Gloucester
Stroud
Cirencester
Northleach
Witney
Oxford
Woodstock
Bicester
Steeple Aston
Farnborough
Banbury
Brackley
Towcester
Newport Pagnell
Bedford
Biggleswade
Sandy
Ampthill
Woburn
Buckingham
Winslow
Aylesbury
Thame
Watlington
High Wycombe
Henley
Marlow
Cookham
Maidenhead
Slough
Windsor
Eton
Staines
Egham
Chertsey
Weybridge
Guildford
Godalming
Haslemere
Petersfield
Alton
Basingstoke
Whitchurch
Andover
Salisbury
Tisbury
Shrewton
Warminster
Frome
Shepton Mallet
Wells
Glastonbury
Taunton
Bridgwater
Yeovil
Sherborne
Dorchester
Weymouth
Bridport
Lyme Regis
Axminster
Honiton
Exeter
Crediton
Okehampton
Launceston
Bude
Wadebridge
Camelford
Padstow
Newquay
St Austell
Truro
Falmouth
Redruth
Penzance
St Ives
Hayle
Helston
Camborne
Liskeard
Looe
Plymouth
Tavistock
Yelverton
Ivybridge
Totnes
Dartmouth
Kingsbridge
Salcombe
Torquay
Paignton
Newton Abbot
Teignmouth
Dawlish
Exmouth
Sidmouth
Budleigh Salterton
Ottery St Mary
Honiton
Axminster
Lyme Regis
Bridport
Dorchester
Weymouth
Swanage
Wareham
Poole
Bournemouth
Christchurch
Ringwood
Fordingbridge
Romsey
Southampton
Eastleigh
Fareham
Portsmouth
Gosport
Havant
Petersfield
Midhurst
Chichester
Bognor Regis
Littlehampton
Worthing
Shoreham
Brighton
Hove
Lewes
Eastbourne
Hastings
Battle
Rye
Winchelsea
Tenterden
Ashford
Hythe
Folkestone
Dover
Deal
Sandwich
Ramsgate
Margate
Whitstable
Faversham
Sittingbourne
Chatham
Rochester
Gravesend
Dartford
Erith
Woolwich
Greenwich
Deptford
Lewisham
Croydon
Sutton
Kingston
Richmond
Twickenham
Hounslow
Heathrow
Uxbridge
Harrow
Wembley
Willesden
Hampstead
Highgate
Finchley
Barnet
Edgware
Watford
Rickmansworth
Chorleywood
Amersham
Chesham
Berkhamsted
Tring
Leighton Buzzard
Dunstable
Luton
Hitchin
Stevenage
Letchworth
Baldock
Royston
Saffron Walden
Bishops Stortford
Hertford
Ware
Hoddesdon
Cheshunt
Waltham Cross
Enfield
Edmonton
Tottenham
Hackney
Stratford
Barking
Dagenham
Romford
Ilford
Wanstead
Leyton
Walthamstow
Chingford
Epping
Ongar
Brentwood
Billericay
Basildon
Grays
Tilbury
Gravesend
Rochester
Chatham
Gillingham
Sittingbourne
Faversham
Whitstable
Canterbury
Herne Bay
Margate
Ramsgate
Deal
Sandwich
Dover
Folkestone
Hythe
Ashford
Tenterden
Rye
Winchelsea
Hastings
Battle
Eastbourne
Lewes
Brighton
Hove
Worthing
Littlehampton
Bognor Regis
Chichester
Havant
Portsmouth
Gosport
Fareham
Southampton
Eastleigh
Romsey
Fordingbridge
Ringwood
Christchurch
Bournemouth
Poole
Wareham
Swanage

THE WEATHER OF OCTOBER.

THE month was dry and mild with remarkably high and steady barometer over practically the whole of the United Kingdom, and few stations received so much as the average rainfall. A marked anticyclone remained central over the southern part of the Kingdom, where the first 12 days were rainless. This, following on the dry period in the latter part of September, constituted an absolute drought of 22 days' duration. At many stations the drought lasted for 25 days. Temperature was high for the time of the year, the shade maximum on the 3rd reaching 70° at Scarborough and 69° at Clacton and Greenwich. Readings over 60° occurred at almost all stations between the 5th and 10th, and so far north as Balmoral the temperature reached 67°, and at Gordon Castle 66°. On the 12th the barometer fell in the south, a small depression passing slowly up the Channel, and on the 14th more than 1 inch of rain fell at many stations in the south Midland counties. At Newport Pagnell 2·21 in. was measured, rain falling heavily from 4 to 9 p.m., with very heavy bursts at intervals. At Brampton the fall was 1·51 in., at Huntingdon 1·40 in., and at Great Paxton 1·28 in. From the 15th to the 20th the barometer again became high and steady and the minimum temperatures of the month were recorded on the 15th at many places in Scotland and Ireland, the lowest reported being 19° at Balmoral, 27° at Markree, and 28° at Nairn and West Linton. From the 21st to 24th a shallow depression moved from the south of Ireland to the north-east of England, and while the weather was practically rainless in part of western Scotland, over the east and south of Great Britain rain fell on most days. On the 22nd 1·57 in. fell at Brecon, 1·16 in. at Tyn-y-waun, 1·10 in. at Nettlebed, and 1·03 in. at Wexcombe. Heavy rain fell over a wide area in the west of Great Britain and in Ireland on the 25th. At Fofany the measurement was 2·13 in., and at Dungeon Ghyll 1·43 in. On the 27th the barometer gradient showed a steady fall from south to north, a condition which was inverted on the 29th, when thunder and lightning occurred at Waterford and Dublin, and heavy rain and hail fell at several stations in Kent with easterly wind. On our north-eastern coasts a heavy easterly gale raged on the 29th and 30th, during which the hospital ship "Rohilla" was wrecked off Whitby and 70 lives were lost. A strong south-east gale and heavy rain were experienced on the 31st over the south-west of England, the heaviest falls reported being 1·47 in. at Moretonhampstead and 1·40 in. at Spreyton.

The duration of sunshine exceeded 100 hours at several stations in the south and west of England, Falmouth having 117·4 hours, Haverfordwest 104·5 hours, and Totland Bay 102·7 hours. Other records were, Tenterden 86·0 hours, Sidmouth 96·3 hours, Matlock Bath 61·2 hours, Bolton 39·2 hours, Southport 70·8 hours, Hull, 59·2 hours, Marchmont 59·9 hours, Killearn 61·9 hours, Oban 64·7 hours, and Loch Stack 59·1 hours.

At many stations there was a total absence of frost, and at places as far north as Ilderton and Whithorn, roses, fuchsias, and other tender plants were still in bloom at the end of the month.

In London the dry spell in the latter part of September continued until October 12th, after which rain fell on most days but the amounts were never large. Temperature remained high, the mean temperature at Camden Square being 52·°0 or 1°·9 above the average. Not since January last has the mean temperature of the month been below the average. The total evaporation was ·70 in. and the duration of rainfall 31·0 hours. The duration of sunshine, 56·6 hours, was the least for October since 1904.

The general rainfall over the Kingdom expressed as a percentage of the average was as follows : England and Wales, 60 ; Scotland, 47 ; Ireland, 55 ; British Isles, 55.

Climatological Table for the British Empire, May, 1914.

STATIONS. (*Those in italics are South of the Equator.*)	Absolute. Maximum. Temp.	Date.	Minimum. Temp.	Date.	Average. Max.	Min.	Dew Point.	Humidity.	Absolute. Max. in Sun.	Min. on Grass.	Total Rain. Depth.	Days.	Aver. Cloud.
	°		°		°	°	°	0-100	°	°	inches		
London, Camden Square	82·9	22	37·7	26	65·5	45·4	45·8	72	124·6	32·2	1·74	8	5·5
Malta	78·1	24	56·5	13	70·2	62·0	...	79	129·0	...	·04	1	1·8
Lagos	91·0	1, 4	72·0	23	88·0	77·6	75·1	76	156·0	70·0	12·03	14	7·9
Cape Town	78·5	14	39·9	18	67·4	52·9	54·2	83	...	...	2·48	13	5·2
Natal, Durban ...	73·0	2, 11	57·0	11*	69·5	61·1	59·7	76	...	...	·27	3	3·6
Johannesburg	73·1	9	40·0	30	66·2	46·9	42·7	70	...	34·5	·40	3	1·9
Mauritius	82·5	9	57·5	30	79·4	65·9	65·0	78	...	50·7	2·87	20	5·2
Bloemfontein	73·9	4	36·2	31	68·1	44·0	38·6	59	...	...	1·25	5	3·4
Calcutta...	96·5	3	71·7	18	92·6	77·9	75·8	77	...	67·6	8·39	7	5·5
Bombay...	93·4	15	80·2	2	92·0	81·9	76·9	74	137·1	73·0	·00	0	3·1
Madras	108·9	31	78·2	6	100·5	82·0	74·5	68	159·2	77·2	·01	1	3·9
Colombo, Ceylon ...	92·2	4	72·0	3	88·3	77·7	76·0	80	160·3	70·0	14·32	18	7·3
Hongkong	90·8	21	66·9	3	82·8	75·3	72·2	80	...	...	12·62	16	7·2
Sydney	73·9	3	44·6	28	66·2	54·6	49·9	75	123·3	38·1	3·17	21	5·0
Melbourne	75·2	11	40·5	16	62·3	47·4	46·6	72	126·2	33·9	2·54	14	6·4
Adelaide	80·8	3	39·8	21	67·2	50·7	48·1	69	136·4	30·8	1·35	13	5·0
Perth	84·8	7	34·3	11	68·3	49·1	47·0	63	139·1	25·5	1·82	12	4·5
Coolgardie	91·8	1	34·8	12	68·5	46·5	42·2	52	149·2	29·4	·03	2	3·7
Hobart, Tasmania ..	70·3	11	38·1	16	58·6	44·7	41·9	67	117·0	30·9	·97	14	5·8
Wellington	63·6	5	35·2	24	55·6	45·2	44·9	82	118·8	26·0	7·97	20	7·7
Auckland	65·0	5	39·0	23	59·6	48·5	48·5	81	127·0	44·0	4·71	19	5·3
Jamaica, Kingston ..	93·8	27	70·6	2	89·6	73·0	70·0	72	...	...	·80	4	4·4
Grenada	88·0	4	70·0	21	82·4	75·0	...	76	136·0	...	3·95	16	5·8
Toronto	87·0	21	34·8	1	69·7	47·4	44·0	61	103·8	32·6	1·50	12	4·0
Fredericton	90·0	26	25·5	17	66·2	39·5	...	68	...	...	1·06	7	5·2
St. John, N.B. ...	78·2	27	27·5	1	55·5	40·3	38·0	78	...	...	·59	11	6·7
Edmonton, Alberta ...	80·2	31	30·1	6	64·0	39·3	...	49	134·8	20·0	1·93	11	4·5
Victoria, B.C.	81·3	21	42·0	1	64·2	47·6	43·0	66	...	...	·18	4	3·6

* 26, 28 and 31.

Johannesburg.—Bright sunshine 265·9 hours.

Mauritius.—Mean temp of air. 0°·2, dew point 0°·5 above, and R ·40 in. below averages. Mean hourly velocity of wind 9·61 miles, or ·66 mile below average.

COLOMBO.—Mean temp. of air 83° or 0°·3 above, of dew point 0°·2 above and R 3·19 in. above, averages. Mean hourly velocity of wind 6·4 miles. TSS on 8 days.

HONGKONG.—Mean temp. of air 78°·5, mean hourly velocity of wind 11·4 miles. Bright sunshine 191·5 hours.

Sydney.—Average temp. 1°·9 above the 55 year's average.

Melbourne.—Mean temp. of air 0°·8 above and R ·38 in. above, averages.

Adelaide.—Mean temp. of air 1°·3 above, and R 1·37 in. below, averages.

Coolgardie.—Temp. of air 0°·1 below, and R 1·25 in. below, averages.

Hobart.—Temp. of air 1°·2 above, and R ·91 in. below, averages.

Wellington.—Mean temp. of air 2°·4 below, and R 3·17 in. below, averages. Bright sunshine 99·4 hours.

Auckland.—Mean temp. of air 3°·0 below, and R slightly above, averages; a showery and stormy month.

ALBERTA.—A sunny, dry, rather warm month with rain slightly above average